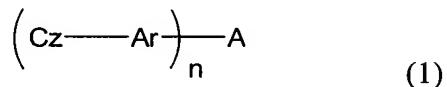


REMARKS

Claims 1-27 are pending in the present application.

The claimed invention is drawn, inter alia, to a carbazole compound of formula (1) as:



wherein

Cz is a substituted or unsubstituted carbazole group;

Ar is a substituted aromatic hydrocarbon group, a substituted aromatic heterocyclic group, or a substituted condensation polycyclic aromatic group, wherein the substituent is selected from the group consisting of a fluorine atom, a chlorine atom, a cyano group, a nitro group, an alkyl group, an alkoxy group, a trifluoromethyl group, a phenyl group, a tolyl group, a naphthyl group, and an aralkyl group;

A is an unsubstituted fluorene group; and

n is an integer of from 1 to 4.

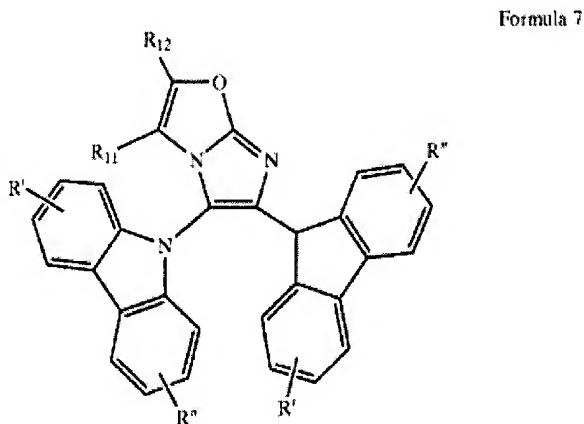
Applicants submit that, for the reasons that follow, the claimed invention is free from the cited art. Reconsideration of the outstanding rejections is requested.

The rejection of Claims 1-8, 10, 12, 17-19, 21, and 23 under 35 U.S.C. §103(a) over Lee et al (US 2005/0074632) is respectfully traversed.

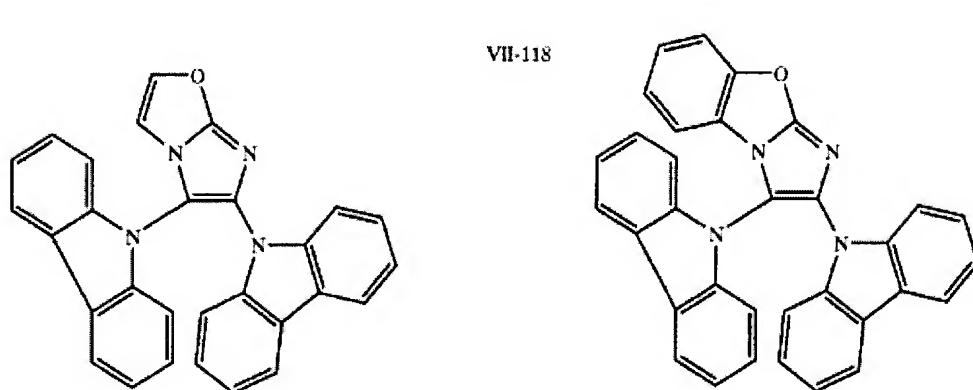
The Examiner acknowledges that Lee differ from the claimed invention because this reference fails to specifically exemplify a compound with in the scope of the claimed invention. Indeed, Lee does not exemplify a compound where Ar is a substituted group containing the specific substituents as in the claimed invention. Specifically, Lee does not exemplify a compound where Ar is “a substituted aromatic hydrocarbon group, a substituted

aromatic heterocyclic group, or a substituted condensation polycyclic aromatic group, wherein the substituent is selected from the group consisting of a fluorine atom, a chlorine atom, a cyano group, a nitro group, an alkyl group, an alkoxy group, a trifluoromethyl group, a phenyl group, a tolyl group, a naphthyl group, and an aralkyl group". Despite this acknowledgement, the Examiner alleges that the skilled artisan would have found it obvious to arrive at this distinction because the generic disclosure of the compounds within these references embrace the compounds as claimed including the substituents.

Applicants disagree with this position by the Examiner. Specifically, Lee explicitly distinguishes from the alleged substitution the Examiner alleges would be obvious based on the generic description of permissible groups for R1-R12. The Examiner points to the compound of generic formula 7 as providing the basis for this rejection. Formula 7 appears on page 3 of Lee as:



The Examiner contends that, based on paragraph [0011] the artisan would have made the substitutions to the imidazole group at R11 and R12 to arrive at the claimed invention. However, this is not correct. Paragraph [0033] specifically limits the scope of R11 and R12 for Formula 7 as being "hydrogen or may combine together to form a substituted or unsubstituted C2-C30 saturated or unsaturated ring". Consistent with this restriction, in paragraph [0045] on page 31, Lee provide the following two specific compounds:



In view of the foregoing, Lee actually teaches away from the substitution the Examiner alleges would be obvious. The Examiner is reminded that “a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention.” *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984) (see MPEP §2141.02).

Withdrawal of this ground of rejection is requested.

The rejections of:

- Claims 1-9, 11, 13-20, 22, and 24-27 under 35 U.S.C. §103(a) over Qiu et al (US 7,227,027); and
- Claims 1-9, 13, 16-20, 24, and 27 under 35 U.S.C. §103(a) over Sato et al (JP 2002-008860),

are respectfully traversed.

As was the case with Lee, the Examiner acknowledges that Qiu and Sato differ from the claimed invention because these references fail to specifically exemplify a compound within the scope of the claimed invention. Neither of these references exemplify a compound where Ar is a substituted group containing the specific substituents as in the claimed invention. Specifically, neither Qiu nor Sato exemplify a compound where Ar is “a

substituted aromatic hydrocarbon group, a substituted aromatic heterocyclic group, or a substituted condensation polycyclic aromatic group, wherein the substituent is selected from the group consisting of a fluorine atom, a chlorine atom, a cyano group, a nitro group, an alkyl group, an alkoxy group, a trifluoromethyl group, a phenyl group, a tolyl group, a naphthyl group, and an aralkyl group". Despite this acknowledgement, the Examiner alleges that the skilled artisan would have found it obvious to arrive at this distinction because the generic disclosure of the compounds within these references embrace the compounds as claimed including the substituents. Again, Applicants disagree.

Specifically, the Examiner is reminded that when a single prior art reference which discloses a genus encompassing the claimed species or subgenus but does not expressly disclose the particular claimed species or subgenus, Office personnel should attempt to find additional prior art to show that the differences between the prior art primary reference and the claimed invention as a whole would have been obvious. MPEP §2144.08 In the case at hand, the Examiner sole position is that the generic disclosure of Qiu and Sato embrace the claimed sub-genus of compounds and, therefore, the claimed invention is obvious. The courts have already confronted this type of rejection and rejected the same. The fact that a claimed species or subgenus is encompassed by a prior art genus is not sufficient by itself to establish a *prima facie* case of obviousness. *In re Baird*, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994) ("The fact that a claimed compound may be encompassed by a disclosed generic formula does not by itself render that compound obvious."); *In re Jones*, 958 F.2d 347, 350, 21 USPQ2d 1941, 1943 (Fed. Cir. 1992) (Federal Circuit has "decline[d] to extract from *Merck [& Co. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir. 1989)] the rule that... regardless of how broad, a disclosure of a chemical genus renders obvious any species that happens to fall within it."). See also *In re Deuel*, 51 F.3d

1552, 1559, 34 USPQ2d 1210, 1215 (Fed. Cir. 1995). Thus, Applicants submit that the Examiner has not met the burden necessary to support a *prima facie* case of obviousness.

Applicants submit that even if, *arguendo*, the Examiner has sufficiently provided that a *prima facie* case of obviousness exists (a point that Applicants disagree with for the reasons above), the Examiner is reminded that "[a] *prima facie* case of obviousness ... is rebuttable by proof that the claimed compounds possess unexpectedly advantageous or superior properties." See MPEP §2144.09 (citing *In re Paesch*, 315 F.2d 381 (C.C.P.A. 1963)). "Evidence that a compound is unexpectedly superior in one of a spectrum of common properties . . . can be enough to rebut a *prima facie* case of obviousness." No set number of examples of superiority is required. *In re Chupp*, 816 F.2d 643, 646, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987)" Applicants submit that the experimental data presented in the specification clearly illustrates that substantial benefits flowing from the claimed method, which are enough to rebut even a *prima facie* case of obviousness.

Specifically, the closest compound in the cited art is 9,9-bis(4-carbazolylphenyl)fluorene (CDPF) appearing as formula (28) in Qiu and compound (H-11) of Sato. CDPF is identical to compound (2) (see Example 1) of the present application. In Example 4 of the present application, Applicants show that the work function of compound (3) (i.e., 9,9-bis(4-carbazolyl-3-methylphenyl)fluorene (CDMPF)) is higher than that of DCPF. Specifically, Example 4 shows the following work function for CDPF and CDMPF:

| | |
|-------|------------------------|
| CDPF | Work function: 5.99 eV |
| CDMPF | Work function: 6.03 eV |

In addition, Example 5 shows that the band gap value of CDMPF is greater than that of CDPF. Specifically, the band gap in Example 5 for CDPF and CDMPF were as follows.

| | |
|-------|--------------------|
| CDPF | Gap value: 3.50 eV |
| CDMPF | Gap value: 3.55 eV |

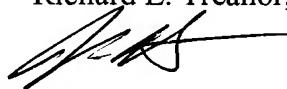
In view of the foregoing, Applicants submit that CDMPF (representative of the presently claimed invention) is unexpectedly more suitable as a host compound for a dopant than CDPF disclosed by Qiu and Sato. Accordingly, Applicants submit that even a *prima facie* case of obviousness is rebutted and should be withdrawn.

Withdrawal of these grounds of rejection is requested.

Applicants submit that the present application is in condition for allowance. Early notification to this effect is respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, L.L.P.
Richard L. Treanor, Ph.D.



Customer Number
22850

Vincent K. Shier, Ph.D.
Registration No. 50,552

Tel: (703) 413-3000
Fax: (703) 413-2220
(OSMMN 08/03)